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AMENDED CLAIMS

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Claims 1, 11, 20 and 30 amended (7 pages)]

1. A method for enhancing data quality using a first data set, a second data set, and a quality enhancement function having at least one parameter, the first data set representing at least one of a scene and a signal, the second data set representing a first portion of the at least one of the scene and the signal, the first data set having a first amount of quality, the second data set having a second amount of quality, the second amount of quality being greater than the first amount of quality, the first data set including first and second data subsets, the first data subset representing the first portion of the at least one of the scene and the signal, the second data subset representing a second portion of the at least one of the scene and the signal, wherein the second portion comprises at least a sub-portion of the at least one of the scene and the signal that is not part of the first portion, each of the first and second data subsets having the first amount of quality, the method comprising:

processing the first data subset and the second data set by a training algorithm to determine a learned value of the at least one parameter, wherein the quality enhancement function is operable to derive, based on the first data subset and using the learned value of the at least one parameter, a data set approximating the second data set; and

processing the second data subset by the quality enhancement function using the learned value of the at least one parameter to derive a third data set, the third data set representing the second portion of the at least one of the scene and the signal, the third data set having a third amount of quality, the third amount of quality being greater than the first amount of quality.

2. A method according to claim 1, wherein the first amount of quality comprises a first resolution, the second amount of quality comprising a second resolution, the third amount of quality comprising a third resolution.

3. A method according to claim 2, wherein the at least one of the scene and the signal comprises the scene, the first resolution comprising at least one of a first spatial resolution, a first intensity resolution, a first spectral resolution, and a first polarization resolution, the second resolution comprising at least one of a second spatial resolution, a second intensity resolution, a second spectral resolution, and a second polarization resolution, the third resolution comprising at least one of a third

spatial resolution, a third intensity resolution, a third spectral resolution, and a third polarization resolution.

4. A method according to claim 2, wherein the first resolution comprises a first temporal resolution, the second resolution comprising a second temporal resolution, the third resolution comprising a third temporal resolution.

5. A method according to claim 2, wherein the at least one of the scene and the signal comprises the signal, the first resolution comprising at least one of a first signal level resolution and a first temporal resolution, the second resolution comprising at least one of a second signal level resolution and a second temporal resolution, the third resolution comprising at least one of a third signal level resolution and a third temporal resolution.

6. A method according to claim 1, wherein the first amount of quality comprises a first signal-to-noise ratio, the second amount of quality comprising a second signal-to-noise ratio, the third amount of quality comprising a third signal-to-noise ratio.

7. A method according to claim 1, wherein the first amount of quality comprises a first accuracy, the second amount of quality comprising a second accuracy, the third amount of quality comprising a third accuracy.

8. A method according the claim 1, wherein the quality enhancement function comprises a polynomial function, the at least one parameter comprising one or more coefficients of the polynomial function.

9. A method according to claim 8, wherein the training algorithm comprises determining a value of each of the one or more coefficients which minimizes a sum of square error values between the second data set and the data set approximating the second data set.

10. A method according to claim 1, wherein the training algorithm comprises determining a value of the at least one parameter which minimizes a sum of square error values between the second data set and the data set approximating the second data set.

11. A method for enhancing the data quality of a first low quality image representing a scene, using a high quality image representing a portion of the scene, a second low quality image representing the portion of the scene, and a quality enhancement function having at least one parameter, wherein the portion of the scene

is less than the entire scene, the high quality image having a first amount of quality, the first and second low quality images having a second amount of quality, the first amount of quality being greater than the second amount of quality, the method comprising:

processing the high quality image and the second low quality image by a training algorithm to determine a learned value of the at least one parameter, wherein the quality enhancement function is operable to derive, based on the second low quality image and using the learned value of the at least one parameter, an image approximating the high quality image; and

processing the first low quality image by the quality enhancement function using the learned value of the at least one parameter to derive an image having a third amount of quality, the third amount of quality being greater than the second amount of quality.

12. A method according to claim 11, wherein the first amount of quality comprises a first resolution, the second amount of quality comprising a second resolution, the third amount of quality comprising a third resolution.

13. A method according to claim 12, wherein the first resolution comprises at least one of a first spatial resolution, a first intensity resolution, a first spectral resolution, and a first polarization resolution, the second resolution comprising at least one of a second spatial resolution, a second intensity resolution, a second spectral resolution, and a second polarization resolution, the third resolution comprising at least one of a third spatial resolution, a third intensity resolution, a third spectral resolution, and a third polarization resolution.

14. A method according to claim 11, wherein the first amount of quality comprises a first signal-to-noise ratio, the second amount of quality comprising a second signal-to-noise ratio, the third amount of quality comprising a third signal-to-noise ratio.

15. A method according to claim 11, wherein the first amount of quality comprises a first accuracy, the second amount of quality comprising a second accuracy, the third amount of quality comprising a third accuracy.

16. A method according the claim 11, wherein the quality enhancement function comprises a polynomial function, the at least one parameter comprising one or more coefficients of the polynomial function.

17. A method according to claim 16, wherein the training algorithm comprises determining a value of each of the one or more coefficients which minimizes a sum of square error values between the high quality image and the image approximating the high quality image.

18. A method according to claim 11, wherein the training algorithm comprises determining a value of the at least one parameter which minimizes a sum of square error values between the high quality image and the image approximating the high quality image.

19. A method according the claim 11, wherein the high quality image represents the scene as viewed from a first viewpoint, the first low quality image representing the scene as viewed from a second viewpoint, the second low quality image representing the scene as viewed from a third viewpoint, the second and third viewpoints being proximate to the first viewpoint.

20. A system for enhancing data quality using a first data set, a second data set, and a quality enhancement function having at least one parameter, the first data set representing at least one of a scene and a signal, the second data set representing a first portion of the at least one of the scene and the signal, the first data set having a first amount of quality, the second data set having a second amount of quality, the second amount of quality being greater than the first amount of quality, the first data set including first and second data subsets, the first data subset representing the first portion of the at least one of the scene and the signal, the second data subset representing a second portion of the at least one of the scene and the signal, wherein the second portion comprises at least a sub-portion of the at least one of the scene and the signal that is not part of the first portion, each of the first and second data subsets having the first amount of quality, the system comprising a processing arrangement configured to perform the steps of:

processing the first data subset and the second data set by a training algorithm to determine a learned value of the at least one parameter, wherein the quality enhancement function is operable to derive, based on the first data subset and using the learned value of the at least one parameter, a data set approximating the second data set; and

processing the second data subset by the quality enhancement function using the learned value of the at least one parameter to derive a third data set, the third

data set representing the second portion of the at least one of the scene and the signal, the third data set having a third amount of quality, the third amount of quality being greater than the first amount of quality.

21. A system according to claim 20, wherein the first amount of quality comprises a first resolution, the second amount of quality comprising a second resolution, the third amount of quality comprising a third resolution.

22. A system according to claim 21, wherein the at least one of the scene and the signal comprises the scene, the first resolution comprising at least one of a first spatial resolution, a first intensity resolution, a first spectral resolution, and a first polarization resolution, the second resolution comprising at least one of a second spatial resolution, a second intensity resolution, a second spectral resolution, and a second polarization resolution, the third resolution comprising at least one of a third spatial resolution, a third intensity resolution, a third spectral resolution, and a third polarization resolution.

23. A system according to claim 21, wherein the first resolution comprises a first temporal resolution, the second resolution comprising a second temporal resolution, the third resolution comprising a third temporal resolution.

24. A system according to claim 21, wherein the at least one of the scene and the signal comprises the signal, the first resolution comprising at least one of a first signal level resolution and a first temporal resolution, the second resolution comprising at least one of a second signal level resolution and a second temporal resolution, the third resolution comprising at least one of a third signal level resolution and a third temporal resolution.

25. A system according to claim 20, wherein the first amount of quality comprises a first signal-to-noise ratio, the second amount of quality comprising a second signal-to-noise ratio, the third amount of quality comprising a third signal-to-noise ratio.

26. A system according to claim 20, wherein the first amount of quality comprises a first accuracy, the second amount of quality comprising a second accuracy, the third amount of quality comprising a third accuracy.

27. A system according the claim 20, wherein the quality enhancement function comprises a polynomial function, the at least one parameter comprising one or more coefficients of the polynomial function.

28. A system according to claim 27, wherein the training algorithm comprises determining a value of each of the one or more coefficients which minimizes a sum of square error values between the second data set and the data set approximating the second data set.

29. A system according to claim 20, wherein the training algorithm comprises determining a value of the at least one parameter which minimizes a sum of square error values between the second data set and the data set approximating the second data set.

30. A system for enhancing the data quality of a first low quality image representing a scene, using a high quality image representing a portion of the scene, a second low quality image representing the portion of the scene, and a quality enhancement function having at least one parameter, wherein the portion of the scene is less than the entire scene, the high quality image having a first amount of quality, the first and second low quality images having a second amount of quality, the first amount of quality being greater than the second amount of quality, the system comprising a processing arrangement configured to perform the steps of:

processing the high quality image and the second low quality image by a training algorithm to determine a learned value of the at least one parameter, wherein the quality enhancement function is operable to derive, based on the second low quality image and using the learned value of the at least one parameter, an image approximating the high quality image; and

processing the first low quality image by the quality enhancement function using the learned value of the at least one parameter to derive an image having a third amount of quality, the third amount of quality being greater than the second amount of quality.

31. A system according to claim 30, wherein the first amount of quality comprises a first resolution, the second amount of quality comprising a second resolution, the third amount of quality comprising a third resolution.

32. A system according to claim 31, wherein the first resolution comprises at least one of a first spatial resolution, a first intensity resolution, a first spectral resolution, and a first polarization resolution, the second resolution comprising at least one of a second spatial resolution, a second intensity resolution, a second spectral resolution, and a second polarization resolution, the third resolution comprising at

least one of a third spatial resolution, a third intensity resolution, a third spectral resolution, and a third polarization resolution.

33. A system according to claim 30, wherein the first amount of quality comprises a first signal-to-noise ratio, the second amount of quality comprising a second signal-to-noise ratio, the third amount of quality comprising a third signal-to-noise ratio.

34. A system according to claim 30, wherein the first amount of quality comprises a first accuracy, the second amount of quality comprising a second accuracy, the third amount of quality comprising a third accuracy.

35. A system according the claim 30, wherein the quality enhancement function comprises a polynomial function, the at least one parameter comprising one or more coefficients of the polynomial function.

36. A system according to claim 35, wherein the training algorithm comprises determining a value of each of the one or more coefficients which minimizes a sum of square error values between the high quality image and the image approximating the high quality image.

37. A system according to claim 30, wherein the training algorithm comprises determining a value of the at least one parameter which minimizes a sum of square error values between the high quality image and the image approximating the high quality image.

38. A system according the claim 30, wherein the high quality image represents the scene as viewed from a first viewpoint, the first low quality image representing the scene as viewed from a second viewpoint, the second low quality image representing the scene as viewed from a third viewpoint, the second and third viewpoints being proximate to the first viewpoint.